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| 10/582,743 | 06/13/2006 | Seok Soo Kim | 930086-2029 | 5014 |
| 7590 Ronald R Santucci Frommer Lawrence & Haug 745 Fifth Avenue New York, NY 10151 | | | EXAMINER BLAND, LAYLA D | |
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/582,743

Applicant(s)

KIM ET AL.

Examiner

LAYLA BLAND

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 July 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6, 15 and 18-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6, 15 and 18-21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-8508)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on July 16, 2009 has been entered.

This Office Action is in response to Applicant's request for continued examination (RCE) filed July 16, 2009, and amendment and response to the Final Office Action (mailed March 16, 2009), filed July 16, 2009 wherein claim 1 is amended and claims 7-14 and 16-17 are canceled.

Claims 1-6, 15, and 18-21 are pending and are examined on the merits herein.

Specification

The amendment filed July 16, 2009 is objected to under 35 U.S.C. 132(a) because it introduces new matter into the disclosure. 35 U.S.C. 132(a) states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows: Example 1 on page 11 was amended to recite 1.5 kg of dimethylether instead of 2 kg. MPEP 2163 states that "An amendment to correct an obvious error does not constitute new matter where one skilled in the art would not only recognize the existence of the error in the specification, but also recognize the appropriate correction." In this case, the skilled

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artisan would not recognize the appropriate correction to the inconsistency between the text of Example 1 and Table 1 because the skilled artisan would not know which number was the correct one. Furthermore, the skilled artisan would not immediately recognize that the reactions in the text of Example 1 and Table 1 were the same, because the text of Example 1 describes a secondary reaction at 75°C and Table 1 shows a secondary reaction temperature of 60°C, and because the amount of dimethyl ether recited in each is different.

Applicant is required to cancel the new matter in the reply to this Office Action.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-6, 15, 16, and 18-20 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contain subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. In the amendment submitted August 18, 2008, claim 1 was amended to include "consists of" in place of "comprises." The specification as originally filed does not provide support for a method with consists of steps a-d. The method of Example 1 includes steps other than a-d, including addition of water and distribution using a sieve. This is a new matter rejection.

Response to Arguments

Applicant argues that addition of water is part of the filtering process. In Example 1 of the specification, addition of water occurs before the filtering process and the mixture is stirred for 10 minutes before filtering. Thus, it appears that addition of water is separate from filtering and not simply part of the filtration process. Furthermore, the prior art teaches that hot water is used for washing cellulose ethers, which is also different from filtration. The examiner was unable to find a definition of "filtering step" in the specification which includes addition of water and subsequent washing with water. Thus, "filtering step" is interpreted to encompass filtering and nothing else. For this reason, the rejection is maintained.

Applicant argues that sieving does not change the end product formed by the claimed process because sieving merely separates out the particles greater than or equal to 100 mesh size. Claims 15, 16, and 19 are drawn to the production of cellulose ethers of a certain particle distribution and bulk density. It is the examiner's understanding that the limitation "particle distribution rate of greater than 99% for the particles of less than 100 mesh in size," means that 99% of the particles are smaller than 100 mesh. Thus, a step which separates out particles which are larger than 100 mesh would be expected to change the particle size distribution of the end product. The bulk density of the product could also be expected to change based on the particle size distribution. Example 1 of the specification indicates that the product under 100 mesh was obtained after distribution. It is unclear whether the product having greater than 99% of particles less than 100 mesh is only that product which passed through the

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sieve or whether the product having greater than 99% of particles less than 100 mesh also includes particles which did not pass through the sieve. If the former is correct and the product is only that which passed through the sieve, then the specification does not provide support for a process "consisting of" the claimed steps and not including distribution using a sieve.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-6, 15, 16, and 18-20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 1 and dependent claims 2-6 and 18-20 recite the limitation "a filtering and drying step." The specification does not define what is encompassed by "a filtering and drying step." In the response submitted July 16, 2009, Applicant states that addition of water is encompassed by the filtering step. As set forth above, Example 1 of the specification recites addition of water separately from filtering. Thus, it is unclear what "a filtering and drying step" encompasses.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-6, 15, 16, and 18-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Onda et al. (US 4,091,205, May 23, 1978, PTO-1449 submitted June 13, 2006) and Haidasch et al. (US 3,251,825, May 17, 1986, of record) in view of Richter (US 2,090,808, August 24, 1937), Dannhorn et al. (US 2002/0038018, March 28, 2002, PTO-892), and Anderson et al. (US 2,647,064, July 28, 1953, of record).

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Onda teaches a process for preparation of low-substituted cellulose ethers starting from wood pulp [see abstract]. The method for the etherification step is conventional, including reaction with an alkyl chloride or alkylene oxide at a temperature from 20-90°C [column 2, lines 25-31]. 100 parts of alkali cellulose formed with sodium

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hydroxide was placed into a reaction vessel and 15 parts methyl chloride was added. Etherification was carried out using 15 parts of methyl chloride using stepwise elevation of temperature: 40°C for 2 hours, 50°C for 1 hour, and 80°C for 1 hour [column 6, Example 2]. In another example, alkali cellulose was reacted with 10.5 parts propylene oxide at 40°C for 1 hour, 50°C for 1 hour, and 70°C for 1 hour [column 4, Example 1]. The fibrous product was washed with water, filtered, then pulverized to form a fine powder, having a particle distribution rate of 0-1.5% for particles of coarser than 100 mesh and loose bulk density of 48-55 g/ml [column 6, Table III].

Onda does not teach a method starting from pulverized cellulose and the second step of Onda's process is carried out at 50°C compared to the 55-65°C required by claim 2.

Haidasch teaches a process for the preparation of mixed cellulose allyl ethers, comprising reaction of alkali cellulose with a low alkyl halide, a low oxalkylating agent and an allyl halide, simultaneously or in any order desired, at raised temperature, and in the presence of organic solvent [column 1, lines 21-28]. Suitable alkali cellulose can be prepared from pulverized cellulose and sodium hydroxide [column 1, lines 29-34]. Methyl chloride, allyl chloride, and ethylene oxide are among preferred etherifying agents [column 1, lines 46-60]. Alkali cellulose containing 1.2-5 moles of alkali can be reacted in one operation with 1.2-4.5 moles of ethylene oxide, 0.7-3 moles of methyl chloride and 0.45-2.0 moles of allyl halide [column 2, lines 28-33]. Etherification is performed at elevated temperature, preferably between 40-100°C, and gradually increasing temperatures may be applied, for a reaction period between about 1-10

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hours [column 2, lines 45-59]. Organic solvents may be utilized to obtain a uniform reaction [column 2, lines 60-62]. After the reaction is complete, excess solvent or etherification agent is drawn off and the product washed with hot water and dried in a dryer or by use of a vacuum. If the product is alkaline, it can be neutralized using acetic acid [column 2, line 67 - column 3, line 3].

Haidasch teaches the use of gradually increasing temperature but does not teach the stepwise elevation required by the instant claims. Haidasch uses pulverized cellulose for the etherification but is silent regarding the particle size and bulk density of the product.

Richter teaches that cellulose ethers of a powder not exceeding about 100 mesh are desirable [page 1, lines 12-17]. The particle size can be achieved by using a ball mill and screening to remove larger particles [page 1, lines 27-34]. Alternatively, the powdered cellulose ethers can be prepared by performing the pulverization to the desired degree of fineness before etherification at any stage of the process [page 2, lines 52-59].

Dannhorn teaches a process of making cellulose ethers wherein dimethyl ether is added after alkanization. Amounts of dimethyl ether which may be used include as little as 67 g of dimethyl ether for 260 g of cellulose, which is about 0.25 parts by weight for 1 part of cellulose. Dannhorn also exemplifies a process using no dimethyl ether [0036-0037].

Anderson teaches that fibrous methyl cellulose may be obtained directly from an operation wherein methyl cellulose is made by etherification of alkali cellulose and washed with hot water [column 2, lines 51-55].

It would have been obvious to one of ordinary skill in the art at the time the invention was made to carry out cellulose etherification using stepwise temperature elevation according to the processes taught by Onda or Haidasch, and including dimethyl ether or diethyl ether as a diluent gas in the amounts taught by Dunnhorn. Onda and Haidasch teach that gradual temperature elevation may be used, is "conventional," and which includes temperature ranges which overlap, or are very close to, the claimed ranges. Thus, the skilled artisan could use the guidance provided by Onda and Haidasch to carry out a conventional etherification which includes stepwise temperature elevation as recited in the instant claims. Onda's products are subjected to grinding after etherification to achieve the desired particle size of smaller than 100 mesh, and Haidasch is silent regarding the particle size of cellulose ethers prepared from pulverized cellulose (without grinding the final product). However, Richter teaches that the desired particle size may be achieved by pulverization of cellulose before etherification or after etherification. Thus, the skilled artisan could envision carrying out Onda's process wherein pulverized cellulose of the desired particle size is used as the starting material instead of grinding the product at the end of the process, and would expect to achieve products of the desired particle size. It has been held that merely reversing the order of steps in a multi-step process is not a patentable modification absent unexpected or unobvious results. Ex parte Rubin, 128 U.S.P.Q. 440 (P.O.B.A.

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1959). Cohn v. Comr. Patents, 251 F. Supp. 437, 148 U.S.P.Q. 486 (D.C. 1966).

Haidasch teaches that organic solvent may be used in the etherification reaction, but is silent regarding how much solvent should be used and which solvents are preferred.

However, Dunnhorn teaches various amounts of dimethyl ether which may be used in cellulose etherification, including an amount that overlaps with the claimed range.

Thus, the skilled artisan could expect good results using Dunnhorn's teachings as guidance. Onda's products are described as fibrous before grinding and Haidasch is silent regarding whether the products obtained from pulverized cellulose are fibrous, but the skilled artisan would expect a fibrous product because Anderson teaches that fibrous cellulose ether products are obtained from an operation which includes washing in hot water, which is part of Onda's and Haidasch's processes.

Response to Arguments

Applicant's arguments with respect to the Hitchin and Schminke references are moot in view of the new ground of rejection.

Applicant argues that the claimed process unexpectedly produces cellulose ethers of small particle size without a grinding step, due to the amounts of diluent gas which are used. Applicant's argument has been carefully considered but is not persuasive. As set forth above, it is unclear whether the product having greater than 99% of particles less than 100 mesh also includes particles which did not pass through the sieve in the distribution step. If the product includes only those particles which did pass through the 100 mesh sieve, then it is entirely expected that the product would be of smaller size than 100 mesh. Furthermore, the data presented in the specification is

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not clear. According to Table 1, reaction using no diluent gas produced the same results as reaction using 1.5 or 2 parts by weight of diluent gas. The examples in the specification used 6 kg of cellulose, so the reactions included 0-12 kg of diluent gas, with no difference in the outcome of the reaction. The difference between 0 and 12 kg is significant, and the skilled artisan would expect some difference in the particle distribution rates if the amount of diluent gas was critical for particle size. Additionally, the temperatures and times in the comparative example are different from all the other examples, so is impossible to make a direct comparison. MPEP 716.01(b) states that "To be given substantial weight in the determination of obviousness or nonobviousness, evidence of secondary considerations must be relevant to the subject matter as claimed." For the reasons set forth above, the nexus between particle size and the claimed method is not clear, and it is not clear what the critical steps are or whether they are recited in the claims. Thus, the data in the specification is not sufficient to overcome the rejection. It is noted that the addition of diluent gas is only required by claim 20; if the diluent gas is critical for achieving the product it should be required by all the claims.

Conclusion

No claims are allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LAYLA BLAND whose telephone number is (571)272-9572. The examiner can normally be reached on Monday - Friday, 7:00 - 3:30.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Anna Jiang can be reached on (571) 272-0627. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Layla Bland/
Examiner, Art Unit 1623

/Shaojia Anna Jiang/
Supervisory Patent Examiner
Art Unit 1623